There is good reason for believing that such an international conference will be arranged, and its action should be of great benefit to the mercantile marines of the world, which are and will remain necessarily in competition with one another, but should not carry on that competition in a manner likely to be prejudicial to the safety of life and property at sea. If the loss of the *Titanic* should bring about a better understanding and the universal acceptance of principles which will add to the security of ocean navigation, the lessons learnt from that terrible disaster will be of permanent value.

THE DISCOVERY OF HUMAN REMAINS AT CUZCO, PERU.

THE Yale expedition to Peru has made an important discovery of human remains in the vicinity of Cuzco, which are described in the April number of the *American Journal of Science*. We have, first, a full report of the circumstances of the "find" by the director of the expedition, Mr. Hiram Bingham. Following this, Mr. I. Bowman contributes a very cautious and well-considered report on the geological position. He comes to the conclusion that the beds in which the remains were found belong to a glacial series; that the bones were deposited during a period of pronounced alluviation; that since their deposition they were overlaid by from 75 to 100 ft. of gravel, and were at a later period partially eroded. Though at first sight the immediate surroundings suggest the occurrence of a landslip, this view does not commend itself to him, and he provisionally estimates the age of the remains at from 20,000 to 40,000 years.

The anatomical material consists of fragments of a cranium, portions of ribs, the right *os innominatum*, one complete and one imperfect femur. Mr. G. F. Eaton's report indicates that this femur falls within the range of femoral variation in normal male adult Peruvians of the later Inca period. The remains were accompanied by a portion of the tibia of a wolf or wolf-like dog, closely resembling a small gray wolf, *Canis occidentalis*. It may be remarked that three varieties of breeds of domestic dogs are known to have existed in Peru during the later Inca period—a small-sized breed of the bulldog or pug type, with a short snout and undershot jaw; a small house-dog like the dachshund, with slender snout; and a larger, slender-limbed variety, with wolf-like skull, originally classed by Tschudi under the name *Canis ingae pecuarius*. The two latter types are supposed to be descended from a larger wolf-like variety, itself derived from the American wolf. Thus the presence in this site of a large wolf-like dog, while it offers in itself no proof of great antiquity, does not render that supposition untenable.

But, besides the canine remains, those of what seems to be a bison have also been found; the study, however, of these rib fragments cannot differentiate the bison from domestic cattle. According to Mr. Eaton, if the Cuzco remains date from a period preceding the Spanish Conquest, it would appear that the bovine remains belong to some species of bison, for no other feral group of the bovidæ need be considered. The difficulty remains that though the Spaniards found captive bison at Montezuma's capital, the American bison in the free state is not known to have ranged further south than north-eastern Mexico.

The existence, therefore, of the associated canine and bovine remains raises considerations not easily reconciled with the geological environment, and for the present the exact age of the Cuzco remains must continue to some extent to be uncertain. It is much to be desired that further examination of this promising site may lead to the discovery of further evidence on which a final decision may be safely based.

THE LATE MR. A. O. HUME, C.B.

MR. ALLAN OCTAVIAN HUME, whose death took place at his residence in Upper Norwood on July 31, at the age of eighty-three, ranks as one of the chief benefactors to the natural history departments of the British Museum. During the latter portion of his career (1849 to 1882) as a Bengal civilian, the deceased gentleman devoted his leisure and much of his fortune to collecting skins and eggs of Indian birds and heads of Indian big game. The result was the bringing together of a collection such as had never been made before, including, as it did, not only specimens obtained by himself and his assistant, Mr. W. R. Davison, but many purchased from other collections. Except for a selection of specimens—chiefly big game—retained for his own lifetime, but ultimately to come, we believe, to the nation, this collection was presented to the British Museum between 1885 and 1891. Previous to this the Museum collection of Indian birds was poor, whereas now it is surpassingly rich.

The total number of skins and eggs of birds added to the Museum collection was 75,577, of which 258 were types. The big-game collection comprised 223 specimens, in addition to which were 371 mammal skins, including several types.

Mr. Hume started and for fifteen years maintained *Stray Feathers*, and was also author or co-author of several other works on Indian ornithology. To kind attention received in the 'seventies at Mr. Hume's Simla residence, the present writer owes his recovery from severe illness. R. L.

NOTES.

THE second International Congress of Entomology was opened at Oxford on Monday last, under the presidency of Prof. E. B. Poulton, F.R.S., and is still in progress.

A COMMITTEE has been appointed by the President of the Board of Trade to advise him, in the interests of safety of life at sea, with regard to methods of stowing, launching, and propelling ships' boats, and other kindred matters. Prof. J. H. Biles is the chairman of the committee, the other members being Rear-Admiral the Hon. S. A. Gough-Calthorpe, Mr. A. E. Doxford, Captain J. G. H. Flint, Mr. M. Joyce, M.P., Mr. J. Maxton, Mr. F. J. Stephen, and Mr. H. B. Wortley. The secretary is Mr. F. P. Robinson, of the Board of Trade. The terms of reference are:—(1) As to what are the most efficient arrangements for stowing boats on steamships of all classes, for launching them in an emergency, and for embarking the passengers and crew; (2) as to whether, and, if so, to what extent, mechanical propulsion can with advantage be adopted either in addition to, or in substitution for, propulsion by oars and sails; (3) as to the question of rafts, and, in particular, whether, if of approved character, they should be allowed in substitution for boats; and, if so, to what extent and under what conditions; (4) whether, independently of the foregoing, the committee desire to make any recommendations with reference to the above-mentioned matters which would in their opinion contribute to the safety of life at sea.

A COMMITTEE, consisting of Mr. R. A. S. Redmayne, C.B., H.M. Chief Inspector of Mines (chairman), Sir Arthur Markham, Bart., M.P., Mr. C. E. Rhodes, Mr. F. Rigby, and Mr. H. Smith, has been appointed by the Home Secretary to inquire into the circumstances in which spontaneous combustion of coal occurs in mines, its causes, and the means of preventing it, or of dealing with it when it has arisen.

HIS attention having been called to the recent developments in wireless telegraphy, Col. Seely, the Secretary for War, has appointed a committee to consider the application of the developments to the needs of the British Army.

THE following appointments to lectureships have been made by the Royal College of Physicians of London:—Goulstonian lectures, Dr. A. J. Jex-Blake; Oliver Sharpey lectures, Dr. A. D. Waller, F.R.S.; Lumleian lectures, Dr. F. de Havilland Hall; Croonian lectures (1912), Prof. C. S. Sherrington, F.R.S.; and FitzPatrick lectures, Dr. C. A. Mercier.

THE annual meeting of the British Pharmaceutical Congress took place in Edinburgh last week. It has been decided to hold the jubilee congress in London next year, and Mr. J. C. Umney has been elected to preside over it.

THE annual autumn meeting of the Institute of Metals is to be held at the Institution of Electrical Engineers, Victoria Embankment, on September 25 and 26. Some ten papers have been prepared for reading and discussion, and a reception and various excursions have been arranged. Weather permitting, aëroplane competitions will take place at Brooklands on September 26 for the Institute of Metals aviation prize. Those desirous of taking part in the meeting are requested to communicate with the secretary, Mr. G. Shaw Scott, Caxton House, Westminster, S.W.

MR. AUSTEN CHAMBERLAIN presided over a meeting on Wednesday of last week at the London Chamber of Commerce, the object of the gathering being the formation of a City subcommittee, and to confer as to the best means of organising a systematic appeal in special directions in support of the fund for placing the London School of Tropical Medicine upon a permanent and adequate basis. A subcommittee of forty-six gentlemen was elected to cooperate with the general committee constituted at the Foreign Office on July 17. It was stated at the meeting that the sum received amounted to 28,000*l*. Since the date of holding the meeting the sum of 500*l*. has been voted to the school by the Chartered Bank of India, Australia, and China.

PROF. W. A. BONE, F.R.S., has accepted an invitation to lecture before the German Chemical Society on November 30 next on "Surface Combustion." The lecture, which will be an open one, will be delivered at the Hofmannhaus, Berlin.

BY the death, at the age of twenty-five, of Harold Donaldson, who was drowned while bathing near Swansea, on Monday, July 29, the National Physical Laboratory has suffered a severe loss. Donaldson entered Sidney Sussex College from the Swansea Technical School with a college scholarship, and at Cambridge took honours in mathematics and physics, greatly distinguishing himself in the latter. He also graduated at London University with honours in physics. After holding for a time the post of assistant demonstrator at the Cavendish Laboratory, and doing some research work under Sir J. J. Thomson, he joined the staff of the National Physical Laboratory rather more than a year ago, and was attached to the metrology division. He soon showed that he had in a high degree all the good qualities needed for such a post. He possessed a clear insight as to the essential points in an investigation, a marked ability in suggesting the method to be adopted, and a ready grasp of the experimental means required for its solution, with great enthusiasm and love for his work. He was careful and accurate and at the same time prompt and businesslike. His investigations into the changes in dimensions of certain fused silica standards promised to be of the first importance; personally he had won the cordial esteem of all his colleagues.

THE death is announced, in his seventy-third year, of Prof. John Alsop Paine, of Tarrytown, N.Y. From 1862 to 1867 he was employed by the New York Board of Regents in research work on the flora of the State. His next appointments were as professor of natural science at Robert College, Constantinople, and the Lake Forest University successively. In later years he gave his attention mainly to archæology. From 1872 to 1874 he was archæologist to the first expedition of the Palestine Exploration Society east of the Jordan and Dead Sea. Prof. Paine was a member of the staff of the "Century Dictionary," and was for seventeen years curator of the Metropolitan Museum of Art, New York.

CAPTAIN AMUNDSEN arrived in Christiania on Wednesday of last week, and was received in audience by King Haakon.

CAPTAIN MIKKELSEN and Mr. Iversen have reached Copenhagen and had bestowed upon them the gold service medal by the King.

THE John Scott legacy medal and premium have been awarded by the Franklin Institute to Mr. S. Cowper-Coles in consideration of his work on the Sherardising process.

RULES and regulations have now been drawn up for the recently established Indian Research Fund Association, particulars of which are to be found in *The Pioneer Mail,* Allahabad, of July 12. The objects for which the association has been established are the prosecution and assistance of research, the propagation of knowledge and experimental measures generally in connection with the causation, mode of spread, and prevention of communicable diseases.

THE British Fire Prevention Committee recently held its summer meeting at the Regent's Park Testing Station, when some important high-temperature fire tests were made on a reinforced concrete floor on sets of electro-glazed casements of the Chadrac type, on sets of electro-glazed casements of the Luxfer type, and with a double door constructed of reinforced concrete made to the specifications of the chairman of the Belgian Government Fire Committee. Reports on the tests are to be published by the Committee in due course.

THE new series of publications issued by the Babylonian Section of the Museum of the University of Pennsylvania continues to make good progress. Part i. of the second volume contains a beautifully copied series of no fewer than 123 plates devoted to "Business Documents of Murashu Sons of Nippur, dated in the Reign of Darius II.," and is the work of Prof. Albert T. Clay. The volume contains 228 legal and commercial documents, which are here published for the first time, and they afford students a mass of new material for obtaining information with regard to the social and economic conditions which prevailed in Babylonia during the Achaemenian period. Not the least interesting feature of these inscriptions are the Aramaic endorsements scratched or written on many of them, and the proper names include many of Persian and Egyptian origin, borne by members of the foreign colonies at Nippur. Part ii. of the volume is devoted to temple-accounts of the Cassite period from Nippur, and we note that one of them bears a very interesting seal-impression, showing the form of plough in use in Babylonia in the fourteenth century B.C. Both Prof. Clay, the editor of the texts, and Mr. Eckley Brinton Coxe, who has established a fund for the publication of the series, are to be congratulated on the able manner in which the work is carried out.

IN the last issue of the *Bulletins et Mémoires de la Société d'Anthropologie* (ser. vi., vol. ii., parts 5 and 6), M. G. Courty makes an attempt to interpret certain rock carvings in the department of Seine-et-Oise. Many of these assume the form of crosses with little circular cups at the extremities of the limbs. These he supposes to represent prehistoric chariots. As an illustration he gives a photograph of a primitive plough still in use in the department of Lot. But M. Marcel Baudoin brings these carvings down to the Neolithic period, and thinks that they represent a modified form of the Swastica symbol, a view certainly more probable than that advanced by M. Courty. The latter is on safer ground when he finds in some of this class of carvings representations of prehistoric huts, with which M. Guébhard aptly compares the series of Etruscan hut urns from the commune of Marino, described by S. L. Pigorini and Lord Avebury ("Archaeologia," Col. xlii. (1869), pp. 99–123).

The Quarterly Review for July, 1912, publishes an excellent article on the study of eugenics by Dr. A. F. Tredgold, who is entitled, both by his qualifications and experience, to speak with authority on the subject. He points out afresh the well-known and disquieting fact that, in spite of all expenditure on education and sanitation, there is a constant increase in the ratio of persons amongst us "who are on the down grade and falling out in the march of civilisation—the biologically unfit." He gives some interesting figures to show that, although the incidence of disease, and especially microbic diseases, such as smallpox, consumption, and typhoid, has been reduced by about 50 or 60 per cent. in the last forty years, and the death-rate has fallen from 21 to 14 per thousand, there is nevertheless an increase in the average rate of illness at all ages in the community, an increase which seems to bear witness to a depressed vitality and power of resistance in the nation. The Hearts of Oak Benefit Society shows an average increase of days' sickness per member from 1·63 in 1901 to 2·37 in 1910, while the National Deposit records an advance from 2·92 to 3·34 days per member. In the Manchester Unity of Oddfellows the average payment per member of sick benefit was 17*s*. 2½*d*. in 1886, and 1*l*. 0*s*. 4¾*d*. in 1910. These figures, which relate to lives specially selected for their prospect of good health, provide the groundwork for much thought in connection with the finance of the National Insurance Act, which takes account of nearly all sections of the population. "Quem Deus vult perdere prius dementat," says Dr. Tredgold with regard to the frantic efforts of those who would seek the national salvation by means of hospitals, asylums, special schools, old-age pensions for paupers, night shelters for vagrants, and free meals for the unemployable. The science of eugenics is no fad of the moment; it is a serious attempt to discover and apply in organised society the principles on which the real improvement and progress of mankind has been and must be based.

SELECTIVE media, *i.e.* media favouring the growth of one species or variety, have been largely used for the isolation of bacteria, particularly those of the "coli" group. Mr. Cecil Revis has investigated the action of some of these media, and finds that they tend to suppress what may be regarded as the feebler growers, so that the particular species or variety isolated will depend largely on the medium employed. He also concludes that the atypical varieties of *B. coli* are not degenerate forms, but are true variants. Coccoid forms of *B. coli* were found to appear in certain media. Experiments were made with ground *B. coli* to detect the presence of intra-cellular enzymes capable of fermenting sugars (which the living organism is able to accomplish), but none was found. Mr. Revis suggests that in the fermentation of dextrose by *B. coli,* gluconic acid is first formed, and that it is quite possible to explain, by successive oxidation, reduction, and condensation, the appearance of all the end-products formed in the fermentation of dextrose by *B. coli* (*Cent. f. Bakt.*, 2nd Abt., Bd. 33, pp. 407 and 424).

PRAZMOWSKI contributes an elaborate study of *Azotobacter chroococcum* to the *Bull. Internat. de l'Acad. des Sciences de Cracovie* (No, 3B, March, 1912). This bacterial organism was isolated from the soil and from Delft canal water by Beijerinck; it forms a brownish pigment and fixes atmospheric nitrogen. A full description of its morphology and development is given. True resistant spores are occasionally formed by it, also "vegetative spores," analogous to the arthrospores of de Bary.

IN the five articles constituting part v. of the Annals of the South African Museum Dr. R. Brom discusses various groups of the local fossil reptiles, describing in the first a new Propappus, and showing that its bigger relative, Pariasaurus, stood higher on its limbs than generally believed. Both reptiles were tortoise-like in habits, and probably protected themselves by digging in the ground. In the second he describes a new mosasaurian of the genus Tylosaurus, and in the third a cynodont from the Stormberg. More important are certain observations in the fourth on the dicynodont skull, where it is stated that the bone in which the pineal foramen is pierced is probably a neomorph, the paired bones behind this representing the parietals. In this connection reference may be made to a paper by the same author, in the second part of the Proceedings of the Zoological Society for 1912, on the structure of the internal ear in dicynodonts and the hemology of the mammalian auditory organs, in which he reverts to the old view that the incus corresponds to the reptilian quadrate, the removal of the latter element from the mandibular joint being foreshadowed in Cynognathus, in which it has partially slipped out.

IN *The Field* of July 27 "Isaac Bikerstaffe" concludes a particularly interesting series of articles entitled "Some Principles of Growth and Beauty"—in other words, on spirals in art and nature. In this final instalment, in which he deals with the spirals of horns, the author has cleared up a misconception with regard to the direction of the twist in the Cyprian sheep and the bharal. In those species the right horn has been stated to form a left-handed spiral, and thereby to differ from that of more typical sheep, in which the spiral is a right one. The difference is really due to the upper part of the horns of the two species in question having undergone a "perversion," whereby a change in the curve has been brought about. Accordingly, all sheep agree in having "homonymous" horns.

IN *The Queensland Naturalist* for May Mr. H. Tryon records the invasion of the Brisbane district and certain other parts of Australia by a large ant (*Pheidole megacephala*), the native home of which is believed to be Mauritius and Madeira. In its new haunts it occurs in myriads, alike in the open country and in houses, and is a deadly enemy to most insects, although not, unfortunately, to aphides and various other species injurious to vegetation.

IN the August number of *The Selborne Magazine* the editor gives a figure of the shell of Gilbert White's tortoise, "Timothy." The shell, which is exhibited in the Reptile Gallery at the Natural History Museum, has lost a few of its horny plates—a circumstance which should have been noted in the legend to the figure.

FROM the Transactions of the Royal Scottish Arboricultural Society, vol. xxvi., part 2, July, 1912, it is pleasing to note that Wiesner's brilliant researches on the *Lichtgenuss* of plants are being followed up by investigators in forestry work. Wiesner's term may be rendered as *photic ration,* or the ratio between the intensity (i.) of the light actually falling upon a plant or its parts, or its habitat, and the intensity (I.) of full daylight at the same time. The ratio between the two intensities (i. : I.) is the *specific photic ration.* In a paper on the relation of light intensity to advance growth—that is, to the trees which have sprung up in openings in the forest, or under the forest canopy, before regeneration fellings were commenced—Mr. G. P. Gordon, B.Sc., describes observations made by him on oak and beech forests. Graphic representations are given, in which the number of seedlings per 0·8 square pole for each species of tree is plotted vertically, while the *specific photic ration* is plotted horizontally. The curve for oak indicates that as the light intensity increases the number of seedlings per unit area of the advance growth increases, reaching a maximum when the light intensity is one-fourth that of full daylight, and that large variations in light intensity are associated with comparatively small changes in number of seedlings. The curve for beech is very different, there being a comparatively large variation in seedling number for a small variation in light intensity, while the maximum is reached at one-fortieth the full daylight intensity. The author concludes by pointing out the practical importance of the *Lichtgenuss* method in forestry.

AN excellent memoir on the North American species of the water-lily, genus Nymphæa, has been published by the Smithsonian Institution (Contributions from the U.S. National Herbarium, vol xvi., part 3). The authors of this monograph, Messrs. Miller and Standley, rightly point out that there are some groups of plants the taxonomy of which cannot be properly understood from ordinary herbarium material, which in the case of succulent plants is often practically useless. This appears to apply also to aquatics, and this memoir represents a remarkably successful attempt to revise the knowledge of an interesting genus in the light of the examination of fresh living material from all parts of a large country. Several new species are described, raising the number for the United States to nineteen, and in all cases the descriptions are accompanied by figures of the leaf out-line and the stigmatic pattern, with photographic illustrations of the flowers, fruits, and seeds, and maps indicating the distribution of the species. In addition there are five beautiful plates showing the plants photographed in their natural surroundings, which add greatly to the attractiveness of this admirable publication.

THOSE who have travelled in Italy and have observed the way in which small birds of every kind are shot for sport will be pleased to read a short note by Prof. Giacinto Martorelli in the *Rendiconto del R. Istituto lombardo,* xlv., 9. The author considers that the laws in force for the protection of wild birds are inadequate to stop the extermination of the large number of migratory species that traverse the Italian mainland twice a year. The object of the paper, generally speaking, is to urge that the close season should commence much earlier than it does at present. He considers that there is no reason for continuing the close season later than August 15, but observes that the laws are not strictly adhered to in practice.

THE results ror the year 1911 of the observations made under the superintendence of the Norwegian Meteorological Institute are given in two large volumes, as in previous years. An outstanding feature of these valuable data, which extend so far north as latitude 71°, is the very large amount of precipitation as rain or snow on the exposed and rugged western borders of the country. A glance at the Daily Weather Charts issued by our own Meteorological Office shows that the majority of the barometric depressions which arrive from the North Atlantic merely skirt our northern shores and expend their energy on the Norwegian coast. On a map which accompanies the rainfall volume, the yearly isohyets are drawn for each 200 millimetres, and show that in several coastal districts the amounts reach 2000 and even 3000 mm. (about 118 inches). But the vapour-laden currents lose most of their moisture on the windward side of the mountains; the districts on the Swedish borders receive an annual rainfall of only 600 or even 400 mm. (15¾ in.). The number of rainfall stations is at present about 500 (one station for each 673 km.^{2}), which compares poorly with that of some other countries, *e.g.*, the British Islands (one station for about each 70 km.^{2}). The careful publication of this large amount of data so nearly up to date reflects much credit upon the director and small staff of the institute in Christiania.

IN the *Mededeelingen en verhandelingen* issued by the Royal Meteorological Institute of the Netherlands (No. 13*a*), Dr. J. P. van der Stok has commenced an important discussion of the climate of the south-eastern part of the North Sea, based on observations made on board the five Dutch lightships. The work is to consist of two parts: (1) the results and discussion of the observations for each separate locality, and (2) summaries of the aggregate results and climatological constants giving a general view of the climate of the whole area. We have received the first instalment of part i., containing the results of twenty-five years' observations at the Terschellingerbank lightship, moored about 12½ miles, and of twenty years' observations at the Haaks lightship, moored about 17 miles off the coast, and embracing together no fewer than ninety-four tables. From the thoroughness with which the work is being carried out we may look forward to some valuable meteorological results.

A NEW geographical magazine has appeared, the *Bulletin de la Société Serbe de Géographie.* As Servian is a language little read outside the country, abstracts of the articles are given in French, German, or Italian. Among the articles in the first number are a discussion of the influence of economic conditions on settlement, a tectonic sketch of the environs of Belgrade, the glaciation of the Sarplanina and the Korab, and on the displacement of the coast line in Croatia and Dalmatia within historic times. In the last the author, A. Gavazzi, of Agram, controverts from personal observation the view frequently expressed that the coast has sunk in the past 2000 years.

PROF. J. C. BRANNER, in a paper read before the Seismological Society of America (Bulletin, vol. ii., pp. 105–117), shows that Brazil is not so free from earthquakes as is often supposed. He gives a list of more than fifty recorded shocks, the first of which, of somewhat doubtful authenticity, occurred in 1560. The majority were of slight intensity, only two attaining a strength sufficient to cause slight damage to buildings. Prof. Branner indicates six small districts, which are occasionally visited by earthquakes. As the country is larger than the United States, covering more than three million square miles, it would seem probable that no other portion of the globe of equal area is so rarely shaken by earthquakes.

A GOOD deal has been recently heard about "holes in the air" in connection with sudden collapses of flying machines. Prof. W. J. Humphreys, of the Washington Weather Bureau, writing in *The Popular Science Monthly* for July, classifies the eight different types of atmospheric disturbance as follows:—A vertical group, including aërial fountains, aërial cataracts, aerial cascades, and aerial breakers, and a horizontal group, including wind layers, wind billows, and aërial torrents; in addition wind eddies fall under both groups. Holes in the sense of vacuous regions do not exist.

THE International Association for promoting the Study of Quaternions and allied systems of mathematics has issued its report for June, 1912 (New Era Press, Lancaster, Penn., U.S.A.). In addition to the usual bibliography, a useful purpose is served by Dr. James Byrnie Shaw's table of comparative notation for vector expressions, which will be extremely handy for reference, and in particular for non-specialists in quaternions when they are reading papers where these are used. A system of notation is also proposed by Dr. Alexander Macfarlane, the president, with a discussion of the underlying principles. M. G. Combebiac gives a notice of the late Captain F. Ferber, better known in connection with aeroplanes than with vectors.